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ABSTRACT

Evaluating the impact of the changing media environment on television programming, a study examined inheritance effects--the percentage of one television program's audience that also watches the program immediately following--in network prime time programming between 1976 and 1985. Inheritance effect was calculated as the correlation between a program share and the share of its network lead-in program, using A. C. Nielsen ratings data. For each year, program shares from the same four two-week summaries were used: the first two-week ratings book in April and November, and the second two-week ratings book in January and July. In addition, for each sample program, the number of other network programs starting at the same time was recorded. Results indicated that inheritance effects in network prime time programing increased between 1979 and 1982, a period of rapid growth in cable television penetration, and then decreased between 1982 and 1985, as the sales of remote control tuning devices jumped. (One table of data is included, and two footnotes and 26 references are appended.) (MM)

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Audience Duplication in the Video Age: Changes in Prime Time Inheritance Effects Between 1976 and 1985

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Abstract

Despite recent interest in new technologies, media researchers have not examined the impact of remote control devices, VCR's, and cable television on inheritance effects. In this study, inheritance effects in network prime time programming were found to have increased between 1979 and 1982, a period of rapid growth in cable television penetration, and then to have decreased between 1982 and 1985, as the sales of remote control tuning devices jumped. These results are discussed in the context of the changing composition of the network prime time television audience.

For a variety of reasons, many viewers opt to remain tuned to the same channel at the conclusion of one program, and their "tuning inertia" (Head & Sterling, 1987, p. 392) carries them through to the following program. Thus, a substantial part of the audience of many television programs is made up of members of the audience inherited from the preceding program. Television programmers have long seen this inheritance or lead-in effect as a major tool of their trade. Such common scheduling strategies as "block programming," "hammocking," and "lead-in placement" attempt either to profit from or to induce inheritance effects (Lewine, 1981; Lewine, Eastman & Adams, 1985). Using a variety of methods, recent studies have documented substantial inheritance effects in a local television market (Webster, 1985), among network programs over a 22 year period (Tiedge & Ksobiech, 1986), and between local news and entertainment programs (Boemer, 1987).

As Webster (1985) notes, earlier researchers (Barwise, Ehrenberg, & Goodhardt, 1982; Goodhardt, Ehrenberg & Collins, 1975; Headen, Klompmaker, & Rust, 1979), defined the inheritance effect as "the proportion of the entire audience that sees any pair of programs" or "as the percentage of one program's audience that also watches another program" (p. 125). However, recent studies (Boemer, 1987; Tiedge & Ksobiech, 1986) have used a more indirect approach to measure audience inheritance. Comparisons of lead-in and program ratings (Boemer, 1987) or shares (Tiedge & Ksobiech, 1986) were presented as evidence of inheritance effects because the similarity of adjacent program

audience size suggests that a substantial proportion of the first program's audience had been inherited by the second program. Although not as precise as earlier definitions,[1] lead-in/program comparisons have one important advantage. They allow an estimation of inheritance effects in circumstances where only rating or share data are available.

Stimulated by Webster and Wakshlag's (1983) model of program choice, researchers have also identified three factors that enhance or inhibit inheritance effects: audience availability, the number of program options, and lead-in/program type similarity. Inheritance effects tend to increase as the size of the available audience increases, because "the same people tend to be available and to watch television in adjacent time periods" (Webster, 1985, p. 123). This tendency makes it difficult to separate inheritance effects from the influence of audience availability. Tiedge and Ksobiech (1986) used share rather than rating data to control for the influence of audience availability on inheritance effects, because shares are "less sensitive than ratings to differing HUT levels among pairs of adjacent programs and thus should be less likely to produce lead-in [inheritance] effects solely as a result of audience availability" (p. 53).

The size of the audience inherited by a program from its preceding program is also affected by the number of program options available to viewers at the beginning of the program (Goodhardt et al., 1975; Tiedge & Ksobiech, 1986; Webster, 1985). The more options--competing programs starting at the

same time as the program--the smaller the inheritance effect. In particular, Tiedge and Ksobiech found that the correlation between network prime time programs and their lead-ins was .69 in one option situations, but it decreased to .53 in two option situations and to .37 in three option situations (p. 59).

Although likely to be confounded by the number of program options, lead-in/program type (e.g. situation comedy, action/adventure, drama) similarity may also contribute to inheritance effects. The size of the audience that the second program inherits from the first is likely to be greater when adjacent programs are of the same type than when the adjacent programs are of different types (Tiedge & Ksobiech, 1986; Webster, 1985). Programmers frequently use block programming scheduling strategies to capitalize on this tendency. Tiedge and Ksobiech found the correlation of ratings shares for two adjacent programs decreased from .62 to .41 when the adjacent programs differed.

Inheritance Effects in an Era of Change

The impact of developing media technologies has been the subject of both theoretical and applied interest to researchers studying television audiences. In their review of the last decade of uses and gratifications research, Palmgreen, Wenner, and Rosengren (1985) suggest that "a major challenge that confronts uses and gratifications researchers is that of adapting and molding the current conceptual framework to deal with new communication technologies" (p. 34). Williams, Phillips, and Lum (1985) concur, noting that "as the degree of

media and content selection increases, the 'audience' takes on more of the nature of individual 'participants' rather than an aggregate group" (p. 251). Clearly, the new media environment allows the "active" audience to become more active. The impact of technology on cultivation theory has also been addressed. Noting that cultivational research developed in an earlier era of limited program choice, Bryant (1986) proclaims that "if cultivation research is to remain current, it will have to accommodate, rather than subordinate, notions of program diversity and audience selectivity" (p. 233).

From the applied perspective, recent studies of the inheritance effect come at a time when researchers are also evaluating the impact of the changing media environment on television programming (Atkin & Litman, 1986; Webster, 1986). Two facets of the new media environment would seem to impact directly upon tuning inertia and thus on inheritance effects. First, since inheritance effects are stronger when there are fewer program options (Tiedge & Ksobiech, 1986; Webster, 1985), the increasing variety of video choices afforded by the rapid growth of cable television penetration and video cassette sales in the 1980's (Atkin & Litman, 1987) should have lead to an erosion of inheritance effects. Because they have more to choose from, a program's viewers should be less likely to be inherited by the next program.

Second, recent rapid growth in the sale of color televisions (Predicasts' Basebook, 1986, p. 597), 38% of which are equipped with remote control tuners (Zeichner, 1984), means that many

consumers are finding it much easier to select from the increasing number of video options. The dramatic growth in VCR sales has also contributed to the remote control boom because many VCR's come equipped with remote control tuners. Electronic Media reported that by 1986 51.3% of U.S. households had remote control televisions. (Harper's Index, 1986, p. 11). Indeed, advertising research has already attributed an increase in commercial avoidance to the "zapping" of commercials by the growing number of consumers with remote control devices (Fountas, 1985; Frank, 1984; Heeter & Greenberg, 1985; Kaplan, 1985; Mermigas, 1984).

These changes in the media environment have lead some media scholars to expect changes in inheritance effects. For example, Webster (1985, p. 131) argues for more exploration of the impact of video recorders, multichannel services and remote control tuners on patterns of audience duplication. Although noting that "programmers continue to assume that tuning inertia prevails in the absence of compelling reasons for change," Head (1985, p. 13) saw increased cable options and remote controls as promoting "channel hopping." Later, Head and Sterling (1987, p. 393) claimed that "remote-control devices and the large number of cable channels have altered this pattern [inheritance effects] in the 1980's." However, they did not present any evidence to support their claim.

In short, previous analysis suggests that developing consumer telecommunications technology--the increase in sales of remote control televisions, VCR's, and the growth of cable

television--has lead to a gradual increase in the frequency of channel changing, which suggests the following hypothesis:

H1: Inheritance effects have decreased as cable, VCR and remote control television penetrations have increased.

The hypothesis was tested by comparing the mean yearly network prime time inheritance during a period of rapid growth in the new media environment. The 10 year period from 1976 to 1985 was selected for analysis because of the rapid growth of cable television, VCR, and remote control television penetration during these years. During this time period, cable television penetration grew from 14.3% to 45.7% (Atkin & Litman, 1986, p. 41), yearly sales of VCR's zoomed from 290,000 to 16,260,000 units (Predicasts' Basebook, 1986, p. 600), and sales of color televisions, many of them equipped with remote controls, increased dramatically (p. 597). Limited resources restricted this study to comparisons of Nielsen share data from four evenly spaced years: 1976, 1979, 1982, and 1985.

To improve the validity of these comparisons, yearly variations in variables related to inheritance effects (audience availability, the number of program options, lead-in/program type similarity) were controlled for. Although evidence of a significant decline in inheritance effects during these years of rapid cable, VCR, and remote control growth would not "prove" that the decline was caused by this growth, it would provide substantial support for that inference.

Method

Program Sample

Consistent with recent research (Tiedge & Ksobiech, 1986), the inheritance effect was operationalized as the correlation between a program share and the share of its network lead-in program. Share data was used to control for variations in audience availability. Restricted access to A. C. Nielsen ratings data necessitated the use of stratified cluster sampling of prime time network program and lead-in program shares. Shares for all programs (N = 1455) with a network lead-in from four two-week summaries of Nielsen TV Audience Estimates were selected for each of four years (1976, 1979, 1982, 1985). For each year, program shares from the same four two-week summaries were used: the first two-week ratings book in April and November, and the second two-week book in January and July. This procedure ensured that the sample programs were stratified to control for the possible influences of seasonal audience changes and ratings sweeps.

Control Variables

Although yearly variations in audience availability could be controlled by the use of shares, other controls were needed for yearly variations in number of program options and lead-in/program type similarity. For each sample program, the number of other network programs starting at the same time were recorded: one option (no other programs starting at the same time), two options (one other program starting) and three options (two other programs starting).

In addition, each program and its lead-in program were assigned to one of 11 program types using the procedure described by Tiedge and Ksobiech (1986). Since Tiedge and Ksobiech included only regularly scheduled programs in their analyses, an additional category was added to include all entertainment specials (e.g. mini-series, awards programs). Lead-in/program type similarity was determined by comparing each programs type to the type of its lead-in program. For example, if an action/adventure program scheduled between 9 and 10 PM was preceded by a situation comedy, a score of zero was recorded for lead-in/program type similarity. But if it was preceded by another action/adventure program, a score of one was recorded.

Results

Although the mean correlation between program and lead-in shares was somewhat stronger than those reported by Tiedge and Ksobiech (1986) (r = .69 versus r =.49), the relationships between inheritance effects, lead-in/program type similarity and number of options followed an identical pattern.

Table 1 about here

The lead-in/program correlation was stronger when programs and their lead-ins were of the same type (r = .82) than when they were of different types (r = .57) and when programs were in the one option situation (r = .89) rather the two options (r =.72), or the three options (r =.58) situations.

For each year, separate partial correlations were run between program and lead-in shares, controlling for the influence of yearly variations in lead-in/program type

similarity and program options. These significant ($p < .001$) partial correlations were as follows: .62 ($n = 351$) in 1976, .64 ($n = 345$) in 1979, .77 ($n = 393$) in 1982, and .64 ($n = 350$) in 1985. Since sample data was used, it was necessary to test the significance of the differences among these four correlations. Fisher's z transformations of the correlations and the chi-square distribution (Marascuilo, 1971, pp. 450-455) were used to test the assumption that all four correlations were equal in the population. This assumption was rejected ($X^2(3, N = 1455) = 21.39, p < .01$). There were three significant ($p < .01$) differences among the six possible correlation comparisons: the lead-in/program correlation was significantly higher in 1982 than in 1976, 1979, or 1985. Thus, inheritance effects were similar in 1976 and 1979, increased sharply in 1982, but returned to their 1979 levels in 1985.

Discussion

The results of this study partially support the hypothesis that inheritance effects have decreased as cable, VCR and remote control television penetrations have increased. Although the correlation between program and lead-in shares showed a significant increase between 1979 and 1982, this trend was reversed between 1982 and 1985, indicating a decrease in inheritance effects.

The unexpected increase in prime time inheritance effects between 1979 and 1982 may be the result of changes in the nature of the prime time television audience. Between the beginning of 1979 and the end of 1982, the median network prime time program

rating dropped from 17.5 to 15.25 (Atkin & Litman, 1986, p. 45). Much of this loss has been attributed to the growth in cable television, independent (non-network) stations, and, to some extent, early VCR sales, all of which compete with network prime time television for viewers. The audience that has been lost to these alternatives may have contained a higher percentage of those viewers less likely to contribute to inheritance effects, namely viewers who are interested in the new possibilities of television (cable channels, independent stations, and video tapes). These "video adventurers" are the very viewers who, previous to the new technological changes in the television industry, would have been the least likely to stay with the current network at the conclusion of a program (i.e. flow into the next network program). Thus, it is quite possible that, because it retained a relatively more "conservative" audience, prime time television experienced greater audience inheritance during these years.

Research on the diffusion of innovations provides some support for this interpretation. The more venturesome viewers postulated here are similar to the early adopters of innovations discussed by Rogers and Shoemaker (1971, pp. 185-191). Several characteristics of early adopters identified by diffusion researchers are consistent with the speculation that early adopters of alternatives to network television would be less likely to be contribute to inheritance effects. For example, since early adopters have a greater awareness of innovations, they are more likely to be familiar with innovations in

television programming. Since they have less dogmatic personalities, they are more likely to be willing to sample that programming. Their favorable attitudes toward change should be related to exploring the evolving programming environment. Finally, their greater exposure to all mass media channels suggests that will make greater use of the channels available to them.

The decrease in inheritance effects between 1982 and 1985 might be attributed to the sharp increase in the numbers of new color televisions and VCR's with remote control tuners sold between those two years (Predicasts' Basebook, 1986; Zeichner, 1984). With only the touch of a button, even less adventuresome viewers may have begun sampling the offerings of competing channels. The impact of these new remote control televisions and VCR's may have been enough to offset the impact of cable television, which may have produced increases in network prime-time audience inheritance between 1979 and 1982 by attracting the adventurous viewer away from the networks.

This analysis of network prime time program shares supports Head and Sterling's (1987) basic contention that audience inheritance effects are declining. However, the evidence presented here documents important distinctions in the impact of specific technologies. For network prime time audiences, inheritance effects were increasing when the cable television boom was peaking. But sharp increases in the sale of remote control color televisions and VCR's were concomitant with a decrease in inheritance effects.[2]

Thus, as the penetration of remote control devices continues to increase, television scheduling strategies based on inheritance effects are likely to be less successful. In addition, the evidence presented here supports the contention of media theorists and critics (Bryant, 1986; Palmgreen et al., 1985, Williams et al., 1985) that viewers are becoming "participants" and that their increased activity must be addressed by mass communication theory and research. It seems that an emerging generation of video participants is actively zapping both commercials and inheritance effects with equal vigor.

Notes

1. When a network maintains constantly high or constantly low ratings throughout prime time on a given evening (high lead-in/program correlation), it is often taken as evidence of strong inheritance effects. However, it is theoretically possible for adjacent programs with the similar ratings to exhibit low inheritance effects: when one program ends, most of its audience flows out, but a nearly equal number of viewers flow in. However, since an average program inherits 50% of its audience (Webster, 1985), situations like this should be relatively rare.

2. Cable television penetration increased from 19% in 1979 to 39.3% in 1983, but by 1985 it had only increased to 45.7% (Atkin & Litman, 1986, p. 41). Color television sales rose from an average of 10.6 million per year from 1976 to 1982 to an average of 16 million per year from 1983 to 1985 (Predicasts' Basebook, 1986, p. 597). VCR sales jumped from an average of 1.8 million per year from 1980 to 1982 to an average of 10.1 million per year from 1983 to 1985 (Predicasts' Basebook, 1986, p. 600).

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Table 1

Pearson r's for the relationship between a program's share and the share of its network lead-in program

Number of alternatives	Program type same as lead program		Program type different from lead program		All programs with a network lead	
	n	r	n	r	n	r
One option	278	.92	96	.81	374	.89
Two options	207	.81	251	.64	458	.72
Three options	207	.74	416	.47	623	.58
For all options	692	.82	763	.57	1455	.69

All correlations were significant ($p < .001$).